



CC does not compete with, or saturate, them, and importation into the  
CC internal chloroplast membrane is achieved without cleavage of the  
CC targeting peptide. The present sequence is that of a region the IE41  
CC protein of Arabidopsis thaliana which is related to the invention.  
XX  
SQ Sequence 61 aa;

Query Match 100.0%; Score 316; DB 8; Length 61;  
Best Local Similarity 100.0%; Pred. No. 4.1e-37;  
Matches 61; Conservative 0; Mismatches 0; Indels 0; Gaps 0;

QY 1 LEATLNPVDMKIQGMIRPFLPRKPCIPATDVAGGVVSGVKNFKAGDVAVLISH 60  
DB 1 LEATLNPVDMKIQGMIRPFLPRKPCIPATDVAGGVVSGVKNFKAGDVAVLISH 60

QY 61 L 61  
DB 61 L 61

RESULT 2  
AAG39983  
ID AAG39983 standard; protein; 324 AA.

AC AAG39983;  
XX  
DT 18-OCT-2000 (first entry)

XX Arabidopsis thaliana protein fragment SEQ ID NO: 49547.

XX Protein identification; signal transduction pathway; metabolic pathway;  
KW hybridisation assay; genetic mapping; gene expression control; promoter;  
KW termination sequence.

XX Arabidopsis thaliana.

XX EPI033405-A2.

XX 06-SEP-2000.

XX 25-FEB-2000; 2000EP-00301439.

XX 25-FEB-1999; 99US-0121825P.

XX 05-MAR-1999; 99US-0123180P.

XX 09-MAR-1999; 99US-0123548P.

XX 23-MAR-1999; 99US-0125788P.

XX 25-MAR-1999; 99US-0126264P.

XX 29-MAR-1999; 99US-0126785P.

XX 01-APR-1999; 99US-0127462P.

XX 06-APR-1999; 99US-0128234P.

XX 08-APR-1999; 99US-0128714P.

XX 16-APR-1999; 99US-0129845P.

XX 19-APR-1999; 99US-0130077P.

XX 21-APR-1999; 99US-0130449P.

XX 23-APR-1999; 99US-0130510P.

XX 28-APR-1999; 99US-0130891P.

XX 30-APR-1999; 99US-0131449P.

XX 30-APR-1999; 99US-0132407P.

XX 04-MAY-1999; 99US-0132484P.

XX 05-MAY-1999; 99US-0132485P.

XX 06-MAY-1999; 99US-0132486P.

XX 07-MAY-1999; 99US-0132487P.

XX 11-MAY-1999; 99US-0134256P.

XX 14-MAY-1999; 99US-0134218P.

XX 14-MAY-1999; 99US-0134219P.

XX 14-MAY-1999; 99US-0134221P.

XX 14-MAY-1999; 99US-0134370P.

XX 18-MAY-1999; 99US-0134768P.

XX 19-MAY-1999; 99US-0134941P.

XX 20-MAY-1999; 99US-0135124P.

XX 21-MAY-1999; 99US-0135353P.

PR 24-MAY-1999; 99US-0135629P.  
PR 25-MAY-1999; 99US-0136021P.  
PR 27-MAY-1999; 99US-0136392P.  
PR 28-MAY-1999; 99US-0136782P.  
PR 01-JUN-1999; 99US-0137222P.  
PR 03-JUN-1999; 99US-0137528P.  
PR 04-JUN-1999; 99US-0137502P.  
PR 07-JUN-1999; 99US-0137724P.  
PR 08-JUN-1999; 99US-0138094P.  
PR 10-JUN-1999; 99US-0138540P.  
PR 10-JUN-1999; 99US-0138847P.  
PR 14-JUN-1999; 99US-0139119P.  
PR 16-JUN-1999; 99US-0139452P.  
PR 16-JUN-1999; 99US-0139453P.  
PR 17-JUN-1999; 99US-0139492P.  
PR 18-JUN-1999; 99US-0139454P.  
PR 18-JUN-1999; 99US-0139455P.  
PR 18-JUN-1999; 99US-0139456P.  
PR 18-JUN-1999; 99US-0139457P.  
PR 18-JUN-1999; 99US-0139458P.  
PR 18-JUN-1999; 99US-0139459P.  
PR 18-JUN-1999; 99US-0139460P.  
PR 18-JUN-1999; 99US-0139461P.  
PR 18-JUN-1999; 99US-0139462P.  
PR 18-JUN-1999; 99US-0139463P.  
PR 18-JUN-1999; 99US-0139750P.  
PR 18-JUN-1999; 99US-0139762P.  
PR 21-JUN-1999; 99US-0139817P.  
PR 22-JUN-1999; 99US-0139899P.  
PR 23-JUN-1999; 99US-0140353P.  
PR 23-JUN-1999; 99US-0140354P.  
PR 24-JUN-1999; 99US-0140591P.  
PR 28-JUN-1999; 99US-0140823P.  
PR 29-JUN-1999; 99US-0140991P.  
PR 30-JUN-1999; 99US-0141287P.  
PR 01-JUL-1999; 99US-0141842P.  
PR 01-JUL-1999; 99US-0142154P.  
PR 02-JUL-1999; 99US-0142055P.  
PR 06-JUL-1999; 99US-0142390P.  
PR 08-JUL-1999; 99US-0142803P.  
PR 09-JUL-1999; 99US-0142920P.  
PR 12-JUL-1999; 99US-0142977P.  
PR 13-JUL-1999; 99US-0143542P.  
PR 14-JUL-1999; 99US-0143624P.  
PR 15-JUL-1999; 99US-0144005P.  
PR 16-JUL-1999; 99US-0144085P.  
PR 16-JUL-1999; 99US-0144086P.  
PR 19-JUL-1999; 99US-0144325P.  
PR 19-JUL-1999; 99US-0144331P.  
PR 19-JUL-1999; 99US-0144332P.  
PR 19-JUL-1999; 99US-0144333P.  
PR 19-JUL-1999; 99US-0144334P.  
PR 19-JUL-1999; 99US-0144335P.  
PR 20-JUL-1999; 99US-0144352P.  
PR 20-JUL-1999; 99US-0144632P.  
PR 20-JUL-1999; 99US-0144884P.  
PR 21-JUL-1999; 99US-0144814P.  
PR 21-JUL-1999; 99US-0145086P.  
PR 21-JUL-1999; 99US-0145088P.  
PR 21-JUL-1999; 99US-0145089P.  
PR 22-JUL-1999; 99US-0145087P.  
PR 22-JUL-1999; 99US-0145088P.  
PR 22-JUL-1999; 99US-0145089P.  
PR 22-JUL-1999; 99US-0145192P.  
PR 22-JUL-1999; 99US-0145193P.  
PR 23-JUL-1999; 99US-0145218P.  
PR 23-JUL-1999; 99US-0145224P.  
PR 23-JUL-1999; 99US-0145276P.  
PR 26-JUL-1999; 99US-0145913P.  
PR 27-JUL-1999; 99US-0145918P.  
PR 27-JUL-1999; 99US-0145919P.  
PR 28-JUL-1999; 99US-0145951P.  
PR 02-AUG-1999; 99US-0146386P.  
PR 02-AUG-1999; 99US-0146388P.

PR 02-AUG-1999; 99US-0146389P.  
 PR 03-AUG-1999; 99US-0147038P.  
 PR 04-AUG-1999; 99US-0147204P.  
 PR 04-AUG-1999; 99US-0147302P.  
 PR 05-AUG-1999; 99US-0147192P.  
 PR 05-AUG-1999; 99US-0147260P.  
 PR 06-AUG-1999; 99US-0147303P.  
 PR 06-AUG-1999; 99US-0147416P.  
 PR 09-AUG-1999; 99US-0147493P.  
 PR 09-AUG-1999; 99US-0147935P.  
 PR 10-AUG-1999; 99US-0148171P.  
 PR 11-AUG-1999; 99US-0148319P.  
 PR 12-AUG-1999; 99US-0148341P.  
 PR 13-AUG-1999; 99US-0148565P.  
 PR 13-AUG-1999; 99US-0148684P.  
 PR 16-AUG-1999; 99US-0149368P.  
 PR 17-AUG-1999; 99US-0149175P.  
 PR 18-AUG-1999; 99US-0149426P.  
 PR 20-AUG-1999; 99US-0149722P.  
 PR 20-AUG-1999; 99US-0149723P.  
 PR 20-AUG-1999; 99US-0149929P.  
 PR 23-AUG-1999; 99US-0149902P.  
 PR 23-AUG-1999; 99US-0149930P.  
 PR 25-AUG-1999; 99US-0150566P.  
 PR 26-AUG-1999; 99US-0150884P.  
 PR 27-AUG-1999; 99US-0151065P.  
 PR 27-AUG-1999; 99US-0151066P.  
 PR 27-AUG-1999; 99US-0151080P.  
 PR 30-AUG-1999; 99US-0151303P.  
 PR 31-AUG-1999; 99US-0151438P.  
 PR 01-SEP-1999; 99US-0151930P.  
 PR 07-SEP-1999; 99US-0152363P.  
 PR 10-SEP-1999; 99US-0153070P.  
 PR 13-SEP-1999; 99US-0153758P.  
 PR 15-SEP-1999; 99US-0154018P.  
 PR 16-SEP-1999; 99US-0154039P.  
 PR 20-SEP-1999; 99US-0154779P.  
 PR 22-SEP-1999; 99US-0155132P.  
 PR 23-SEP-1999; 99US-0155486P.  
 PR 24-SEP-1999; 99US-0155659P.  
 PR 26-SEP-1999; 99US-0156458P.  
 PR 29-SEP-1999; 99US-0156596P.  
 PR 04-OCT-1999; 99US-0157117P.  
 PR 05-OCT-1999; 99US-0157553P.  
 PR 06-OCT-1999; 99US-0157865P.  
 PR 07-OCT-1999; 99US-0158029P.  
 PR 08-OCT-1999; 99US-0158232P.  
 PR 12-OCT-1999; 99US-0158369P.  
 PR 13-OCT-1999; 99US-0158293P.  
 PR 13-OCT-1999; 99US-0158294P.  
 PR 13-OCT-1999; 99US-0159295P.  
 PR 14-OCT-1999; 99US-0159329P.  
 PR 14-OCT-1999; 99US-0159330P.  
 PR 14-OCT-1999; 99US-0159331P.  
 PR 14-OCT-1999; 99US-0159637P.  
 PR 14-OCT-1999; 99US-0159638P.  
 PR 14-OCT-1999; 99US-0159639P.  
 PR 18-OCT-1999; 99US-0159584P.  
 PR 21-OCT-1999; 99US-0160741P.  
 PR 21-OCT-1999; 99US-0160767P.  
 PR 21-OCT-1999; 99US-0160768P.  
 PR 21-OCT-1999; 99US-0160770P.  
 PR 21-OCT-1999; 99US-0160814P.  
 PR 21-OCT-1999; 99US-0160815P.  
 PR 22-OCT-1999; 99US-0160980P.  
 PR 22-OCT-1999; 99US-0160981P.  
 PR 22-OCT-1999; 99US-0160989P.  
 PR 25-OCT-1999; 99US-0161404P.  
 PR 25-OCT-1999; 99US-0161405P.  
 PR 25-OCT-1999; 99US-0161406P.  
 PR 26-OCT-1999; 99US-0161359P.  
 PR 26-OCT-1999; 99US-0161360P.  
 PR 26-OCT-1999; 99US-0161361P.  
 PR 28-OCT-1999; 99US-0161920P.

PR 28-OCT-1999; 99US-01619992P.  
 PR 28-OCT-1999; 99US-01619932P.  
 PR 29-OCT-1999; 99US-0162142P.

Query Match  
 Beat Local Similarity 100.0%; Score 316; DB 3; Length 324;  
 Matches 61; Conservative 0; Mismatches 0; Indels 0; Gaps 0;

OY 1 LEATSLNPVDWKIKGKIRPFLPKRPICIPATDVAGEVVEVGGVKNFKAGDKVAVLISH 60  
 DB 35 LEATSLNPVDWKIKGKIRPFLPKRPICIPATDVAGEVVEVGGVKNFKAGDKVAVLISH 94

OY 61 L 61  
 DB 95 L 95

RESULT 3  
 ID AAG39982 standard; protein; 329 AA.  
 AC AAG39982;  
 XX 18-OCT-2000 (first entry)  
 DT Arabidopsis thaliana protein fragment SEQ ID NO: 49546.  
 DE  
 XX Protein identification; signal transduction pathway; metabolic pathway;  
 KW hybridisation assay; genetic mapping; gene expression control; promoter;  
 KM termination sequence.  
 OS Arabidopsis thaliana.  
 XX  
 PN EP1033405-A2.  
 XX  
 PD 06-SEP-2000.  
 XX  
 XX 25-FEB-2000; 2000EP-00301439.  
 PF  
 XX 25-FEB-1999; 99US-0121825P.  
 PR 05-MAR-1999; 99US-0123180P.  
 PR 09-MAR-1999; 99US-0123548P.  
 PR 23-MAR-1999; 99US-0125788P.  
 PR 25-MAR-1999; 99US-0126264P.  
 PR 29-MAR-1999; 99US-0126785P.  
 PR 01-APR-1999; 99US-0127462P.  
 PR 06-APR-1999; 99US-0128234P.  
 PR 08-APR-1999; 99US-0128714P.  
 PR 16-APR-1999; 99US-0129845P.  
 PR 19-APR-1999; 99US-0130077P.  
 PR 21-APR-1999; 99US-0130449P.  
 PR 23-APR-1999; 99US-0130510P.  
 PR 23-APR-1999; 99US-0130891P.  
 PR 28-APR-1999; 99US-0131449P.  
 PR 30-APR-1999; 99US-0132048P.  
 PR 04-MAY-1999; 99US-0132407P.  
 PR 05-MAY-1999; 99US-0132484P.  
 PR 06-MAY-1999; 99US-0132485P.  
 PR 06-MAY-1999; 99US-0132486P.  
 PR 07-MAY-1999; 99US-0132487P.  
 PR 11-MAY-1999; 99US-0132863P.  
 PR 14-MAY-1999; 99US-01334218P.  
 PR 14-MAY-1999; 99US-01334221P.  
 PR 14-MAY-1999; 99US-0133470P.  
 PR 18-MAY-1999; 99US-0134768P.  
 PR 19-MAY-1999; 99US-0134941P.  
 PR 20-MAY-1999; 99US-0135124P.  
 PR 21-MAY-1999; 99US-0135323P.  
 PR 24-MAY-1999; 99US-0135629P.  
 PR 25-MAY-1999; 99US-0136021P.  
 PR 27-MAY-1999; 99US-0136392P.

GenCore version 5.1.8  
Copyright (c) 1993 - 2006 Bioacceleration Ltd.

OM protein - protein search, using sw model

Run on: May 8, 2006, 20:16:32 ; Search time 186 Seconds  
(without alignments)  
25.985 Million cell updates/sec

Title: us-10-517-309-1\_COPY\_49\_59

Perfect score: 63

Sequence: 1 DMKIQGMIRP 11

Scoring table: BLOSUM62  
Gapop 10.0 , Gapext 0.5

Searched: 2443163 seqs, 439378781 residues

Total number of hits satisfying chosen parameters: 2443163

Minimum DB seq length: 0  
Maximum DB seq length: 200000000

Post-processing: Minimum Match 0%  
Maximum Match 100%

Listing first 1000 summaries

Database :

1: \_A\_Geneseq\_21:.\*  
2: Geneseq1980s:.\*  
3: Geneseq1990s:.\*  
4: Geneseq2000s:.\*  
5: Geneseq2002s:.\*  
6: Geneseq2003as:.\*  
7: Geneseq2003bs:.\*  
8: Geneseq2004s:.\*  
9: Geneseq2005s:.\*

Pred. No. is the number of results predicted by chance to have a  
score greater than or equal to the score of the result being printed,  
and is derived by analysis of the total score distribution.

# SUMMARIES

Result No.	Score	Query Match	Length	DB ID	Description
1	63	100.0	61	8	ADG93324 A thalian
2	63	100.0	262	3	ADG05068 Arabidops
3	63	100.0	267	3	ADG05067 Arabidops
4	63	100.0	292	3	ADG05066 Arabidops
5	63	100.0	324	3	ADG39983 Arabidops
6	63	100.0	329	3	ADG39982 Arabidops
7	63	100.0	329	5	ADG29214 Arabidops
8	63	100.0	329	8	ADG93321 Arabidops
9	63	100.0	329	8	ADG63876 Arabidops
10	63	100.0	354	3	ADG39981 Arabidops
11	62	98.4	370	8	ADG04426 Arabidops
12	57	90.5	61	8	ADG93323 Arabidops
13	57	90.5	329	8	ADG93325 Arabidops
14	44	69.8	360	8	ADG08875 Arabidops
15	41	65.1	1024	9	ADG15659 Arabidops
16	41	65.1	1039	3	ADG58837 Arabidops
17	40	63.5	341	4	ADG50678 Arabidops
18	40	63.5	354	2	ADG73310 Arabidops
19	39	61.9	425	8	ADG27702 Arabidops
20	39	61.9	507	4	ADG51183 Arabidops
21	39	61.9	507	6	ADG63564 Arabidops
22	39	61.9	507	6	ADG63564 Arabidops
23	39	61.9	1026	5	ADG93322 Arabidops
24	38.5	61.1	353	7	ADG67123 Arabidops

25	38	60.3	212	3	ADG50404 Arabidops
26	38	60.3	212	3	ADG11179 Arabidops
27	38	60.3	240	3	ADG11178 Arabidops
28	38	60.3	240	3	ADG50403 Arabidops
29	38	60.3	266	3	ADG11177 Arabidops
30	38	60.3	266	3	ADG50402 Arabidops
31	38	60.3	349	9	ADG51098 Arabidops
32	38	60.3	363	9	ADG91427 Arabidops
33	38	60.3	375	3	ADG32212 Arabidops
34	38	60.3	393	6	ADG30615 Arabidops
35	38	60.3	423	3	ADG32211 Arabidops
36	38	60.3	485	3	ADG23210 Arabidops
37	38	60.3	531	7	ADG07363 Arabidops
38	38	60.3	644	3	ADG15627 Arabidops
39	38	60.3	687	3	ADG15626 Arabidops
40	38	60.3	696	3	ADG15625 Arabidops
41	38	60.3	900	6	ADG35311 Arabidops
42	38	60.3	1752	6	ADG14923 Arabidops
43	38	60.3	1752	6	ADG14916 Arabidops
44	38	60.3	1810	4	ADG71194 Arabidops
45	38	60.3	3387	4	ADG07991 Arabidops
46	38	60.3	3387	4	ADG07992 Arabidops
47	38	60.3	3387	6	ADG35313 Arabidops
48	38	60.3	3387	6	ADG35312 Arabidops
49	38	60.3	3388	6	ADG35314 Arabidops
50	37	58.7	290	8	ADG89125 Arabidops
51	37	58.7	294	5	ADG66291 Arabidops
52	37	58.7	338	8	ADG23863 Arabidops
53	37	58.7	350	9	ADG51103 Arabidops
54	37	58.7	357	3	ADG31747 Arabidops
55	37	58.7	440	3	ADG31746 Arabidops
56	37	58.7	495	2	ADG13648 Arabidops
57	37	58.7	505	4	ADG0648 Arabidops
58	37	58.7	512	3	ADG31745 Arabidops
59	37	58.7	546	7	ADG077105 Arabidops
60	37	58.7	718	8	ADG22220 Arabidops
61	37	58.7	737	8	ADG24980 Arabidops
62	37	58.7	782	6	ADG29962 Arabidops
63	37	58.7	814	6	ADG96535 Arabidops
64	37	58.7	1249	8	ADG23446 Arabidops
65	36.5	57.9	218	8	ADG77098 Arabidops
66	36	57.1	48	3	ADG58731 Arabidops
67	36	57.1	58	4	ADG43092 Arabidops
68	36	57.1	58	4	ADG36919 Arabidops
69	36	57.1	58	4	ADG6813 Arabidops
70	36	57.1	58	4	ADG6391 Arabidops
71	36	57.1	58	4	ADG58490 Arabidops
72	36	57.1	58	5	ADG45965 Arabidops
73	36	57.1	72	8	ADG58737 Arabidops
74	36	57.1	86	8	ADG58733 Arabidops
75	36	57.1	110	4	ADG30331 Arabidops
76	36	57.1	111	4	ADG89172 Arabidops
77	36	57.1	136	8	ADG58734 Arabidops
78	36	57.1	138	4	ADG06113 Arabidops
79	36	57.1	139	4	ADG06112 Arabidops
80	36	57.1	139	4	ADG98705 Arabidops
81	36	57.1	167	5	ADG68033 Arabidops
82	36	57.1	167	8	ADG58718 Arabidops
83	36	57.1	167	8	ADG58721 Arabidops
84	36	57.1	167	8	ADG98789 Arabidops
85	36	57.1	167	8	ADG98044 Arabidops
86	36	57.1	191	8	ADG58730 Arabidops
87	36	57.1	191	8	ADG98047 Arabidops
88	36	57.1	207	7	ADG86949 Arabidops
89	36	57.1	210	7	ADG08345 Arabidops
90	36	57.1	213	4	ADG10686 Arabidops
91	36	57.1	217	8	ADG58724 Arabidops
92	36	57.1	217	8	ADG98045 Arabidops
93	36	57.1	219	4	ADG80153 Arabidops
94	36	57.1	248	6	ADG18749 Arabidops
95	36	57.1	277	7	ADG068173 Arabidops
96	36	57.1	292	6	ADG31176 Arabidops
97	36	57.1	317	6	ADG15932 Arabidops

974	33	52.4	727	8	ADQ17843	Adq17843 Human soc
975	33	52.4	727	9	AE870597	Aeb70597 Procollag
976	33	52.4	727	9	AE870596	Aeb70596 Procollag
977	33	52.4	728	2	AAW44851	Aaw44851 Hereditar
978	33	52.4	728	6	ABG74453	Abg74453 Human exo
979	33	52.4	728	7	ADJ71171	Adj71171 Human hea
980	33	52.4	729	9	AE870602	Aeb70602 Lysyl hyd
981	33	52.4	736	1	AE870601	Aeb70601 Lysyl hyd
982	33	52.4	738	1	AAAP70382	Aap70382 Sequence
983	33	52.4	738	2	AAAP70382	Aap70382 Sequence
984	33	52.4	738	4	AAAB62882	Aab62882 Membrane
985	33	52.4	738	4	AAAB62881	Aab62881 Membrane
986	33	52.4	738	4	AAE06668	Aae06668 Mouse p97
987	33	52.4	738	5	AAU78363	Aau78363 Cell diff
988	33	52.4	738	5	ADN11150	Adn11150 Human mel
989	33	52.4	738	8	ADU82735	Adu82735 Human mel
990	33	52.4	770	4	AB869397	Abb69397 Drosophila
991	33	52.4	772	4	AB869397	Abb69397 Drosophila
992	33	52.4	774	9	AE870599	Aeb70599 Lysyl hyd
993	33	52.4	967	8	AD821876	Ads21876 Bacterial
994	33	52.4	1010	9	ADK39944	Adk39944 HIV Pol p
995	33	52.4	1246	6	ABU46960	Abu46960 Protein e
996	33	52.4	1298	7	ADG48229	Adg48229 Human ret
997	33	52.4	1322	7	ADG48228	Adg48228 Human ret
998	33	52.4	1376	7	AAE39971	Aae39971 Human CRU
999	33	52.4	1376	7	ADJ68965	Adj68965 Human hea
1000	33	52.4	1376	9	ADV70178	Adv70178 Tumor-ass

## ALIGNMENTS

RESULT 1  
ADG93324  
ID ADG93324 standard; protein; 61 AA.

ADG93324;  
11-MAR-2004 (first entry)

A thaliana IB41 protein region related to plastid targeting peptides.

intraplastid targeting peptide; protein transport; plast; chloroplast;  
transgenic plant; lipid biosynthesis; lipid; starch; vitamin; hormone;  
disease resistance; herbicide resistance; light capture; bioremediation;  
TOC membrane import pathway; TIC membrane import pathway;  
internal chloroplast membrane; IB41.

Arabidopsis thaliana.  
WO2004001050-A1.  
31-DEC-2003.  
19-JUN-2003; 2003WO-FR001877.  
21-JUN-2002; 2002FR-00007729.  
(GENO-) GENOPLANTE-VALOR.  
Mirae S, Salvi D, Rolland N, Joyard J, Ferro M, Garin J;  
Grunwald D;  
WPI; 2004-082507/08.  
New intraplastid targeting peptide, useful for delivering fused  
heterologous sequences for preparing transgenic plants having altered  
characteristics.  
Claim 1; SEQ ID NO 4; 63pp; French.  
This invention relates to a novel intraplastid targeting peptide. The  
peptide may be used to transport selected proteins to plasts,

specifically chloroplasts, to create transgenic plants having altered  
characteristics. These altered characteristics include, for example,  
improved biosynthesis of lipids, starch, vitamins, hormones or proteins;  
increased resistance to diseases and herbicides; more efficient light  
capture; or overexpression of proteins involved in bioremediation. The  
invention does not depend on the TOC or TIC membrane import pathways, so  
does not compete with, or saturate, them, and importation into the  
internal chloroplast membrane is achieved without cleavage of the  
CC targeting peptide. The present sequence is that of a region the IB41  
protein of Arabidopsis thaliana which is related to the invention.

SO Sequence 61 AA;  
Query Match 100.0%; Score 63; DB 8; Length 61;  
Best Local Similarity 100.0%; Pred. No. 0.0004;  
Matches 11; Conservative 0; Mismatches 0; Indels 0; Gaps 0;

QY 1 DWIKQGMIRP 11  
10 DWIKQGMIRP 20

Db 10 DWIKQGMIRP 20

RESULT 2  
AAG05068  
ID AAG05068 standard; protein; 262 AA.

AAG05068;  
17-OCT-2000 (first entry)

Arabidopsis thaliana protein fragment SEQ ID NO: 1332.

Protein identification; signal transduction pathway; metabolic pathway;  
hybridisation assay; genetic mapping; gene expression control; promoter;  
termination sequence.

Arabidopsis thaliana.  
EP1033405-A2.  
06-SEP-2000.

25-FEB-2000; 2000EP-00301439.  
25-FEB-1999; 99US-0121825P.  
05-MAR-1999; 99US-0123180P.  
09-MAR-1999; 99US-0123548P.  
23-MAR-1999; 99US-0126264P.  
25-MAR-1999; 99US-0126264P.  
29-MAR-1999; 99US-0126785P.  
01-APR-1999; 99US-0127462P.  
06-APR-1999; 99US-0128234P.  
08-APR-1999; 99US-0128714P.  
16-APR-1999; 99US-0129845P.  
19-APR-1999; 99US-0130077P.  
21-APR-1999; 99US-0130449P.  
23-APR-1999; 99US-0130510P.  
28-APR-1999; 99US-0130891P.  
30-APR-1999; 99US-0131449P.  
30-APR-1999; 99US-0132048P.  
30-APR-1999; 99US-0132407P.  
04-MAY-1999; 99US-0132484P.  
05-MAY-1999; 99US-0132485P.  
06-MAY-1999; 99US-0132486P.  
07-MAY-1999; 99US-0132863P.  
11-MAY-1999; 99US-0134256P.  
14-MAY-1999; 99US-0134219P.  
14-MAY-1999; 99US-0134219P.  
14-MAY-1999; 99US-0134221P.  
14-MAY-1999; 99US-0134370P.  
18-MAY-1999; 99US-0134768P.  
19-MAY-1999; 99US-0134941P.

PR 20-MAY-1999; 99US-0135124P.  
PR 21-MAY-1999; 99US-0135353P.  
PR 24-MAY-1999; 99US-0135629P.  
PR 25-MAY-1999; 99US-0136021P.  
PR 27-MAY-1999; 99US-0136392P.  
PR 28-MAY-1999; 99US-0136782P.  
PR 01-JUN-1999; 99US-0137222P.  
PR 03-JUN-1999; 99US-0137528P.  
PR 04-JUN-1999; 99US-0137502P.  
PR 07-JUN-1999; 99US-0137724P.  
PR 08-JUN-1999; 99US-0138094P.  
PR 10-JUN-1999; 99US-0138540P.  
PR 10-JUN-1999; 99US-0138847P.  
PR 14-JUN-1999; 99US-0139119P.  
PR 16-JUN-1999; 99US-0139452P.  
PR 16-JUN-1999; 99US-0139453P.  
PR 17-JUN-1999; 99US-0139492P.  
PR 18-JUN-1999; 99US-0139454P.  
PR 18-JUN-1999; 99US-0139455P.  
PR 18-JUN-1999; 99US-0139456P.  
PR 18-JUN-1999; 99US-0139457P.  
PR 18-JUN-1999; 99US-0139458P.  
PR 18-JUN-1999; 99US-0139459P.  
PR 18-JUN-1999; 99US-0139460P.  
PR 18-JUN-1999; 99US-0139461P.  
PR 18-JUN-1999; 99US-0139462P.  
PR 18-JUN-1999; 99US-0139463P.  
PR 18-JUN-1999; 99US-0139750P.  
PR 18-JUN-1999; 99US-0139763P.  
PR 21-JUN-1999; 99US-0139817P.  
PR 22-JUN-1999; 99US-0139899P.  
PR 23-JUN-1999; 99US-0140353P.  
PR 23-JUN-1999; 99US-0140354P.  
PR 24-JUN-1999; 99US-0140695P.  
PR 28-JUN-1999; 99US-0140823P.  
PR 29-JUN-1999; 99US-0140991P.  
PR 30-JUN-1999; 99US-0141287P.  
PR 01-JUL-1999; 99US-0141842P.  
PR 01-JUL-1999; 99US-0142154P.  
PR 02-JUL-1999; 99US-0142055P.  
PR 06-JUL-1999; 99US-0142390P.  
PR 08-JUL-1999; 99US-0142803P.  
PR 09-JUL-1999; 99US-0142820P.  
PR 12-JUL-1999; 99US-0142877P.  
PR 13-JUL-1999; 99US-0143422P.  
PR 14-JUL-1999; 99US-0143624P.  
PR 15-JUL-1999; 99US-0144005P.  
PR 16-JUL-1999; 99US-0144085P.  
PR 16-JUL-1999; 99US-0144086P.  
PR 19-JUL-1999; 99US-0144325P.  
PR 19-JUL-1999; 99US-0144331P.  
PR 19-JUL-1999; 99US-0144332P.  
PR 19-JUL-1999; 99US-0144333P.  
PR 19-JUL-1999; 99US-0144334P.  
PR 19-JUL-1999; 99US-0144335P.  
PR 20-JUL-1999; 99US-0144352P.  
PR 20-JUL-1999; 99US-0144632P.  
PR 20-JUL-1999; 99US-0145087P.  
PR 22-JUL-1999; 99US-0145089P.  
PR 22-JUL-1999; 99US-0145192P.  
PR 23-JUL-1999; 99US-0145145P.  
PR 23-JUL-1999; 99US-0145218P.  
PR 23-JUL-1999; 99US-0145244P.  
PR 26-JUL-1999; 99US-0145276P.  
PR 27-JUL-1999; 99US-0145913P.  
PR 27-JUL-1999; 99US-0145918P.  
PR 27-JUL-1999; 99US-0145919P.  
PR 28-JUL-1999; 99US-0145951P.  
  
PR 02-AUG-1999; 99US-0146386P.  
PR 02-AUG-1999; 99US-0146388P.  
PR 02-AUG-1999; 99US-0146389P.  
PR 03-AUG-1999; 99US-0147038P.  
PR 04-AUG-1999; 99US-0147204P.  
PR 04-AUG-1999; 99US-0147302P.  
PR 05-AUG-1999; 99US-0147719P.  
PR 05-AUG-1999; 99US-0147760P.  
PR 06-AUG-1999; 99US-0147703P.  
PR 06-AUG-1999; 99US-0147741P.  
PR 09-AUG-1999; 99US-0147493P.  
PR 09-AUG-1999; 99US-0147935P.  
PR 10-AUG-1999; 99US-0148171P.  
PR 11-AUG-1999; 99US-0148319P.  
PR 12-AUG-1999; 99US-0148341P.  
PR 13-AUG-1999; 99US-0148565P.  
PR 16-AUG-1999; 99US-0148684P.  
PR 16-AUG-1999; 99US-0149175P.  
PR 17-AUG-1999; 99US-0149175P.  
PR 18-AUG-1999; 99US-0149426P.  
PR 20-AUG-1999; 99US-0149722P.  
PR 20-AUG-1999; 99US-0149723P.  
PR 20-AUG-1999; 99US-0149929P.  
PR 23-AUG-1999; 99US-0149902P.  
PR 23-AUG-1999; 99US-0149930P.  
PR 25-AUG-1999; 99US-0150566P.  
PR 26-AUG-1999; 99US-0150884P.  
PR 27-AUG-1999; 99US-0151065P.  
PR 27-AUG-1999; 99US-0151066P.  
PR 27-AUG-1999; 99US-0151080P.  
PR 30-AUG-1999; 99US-0151303P.  
PR 31-AUG-1999; 99US-0151388P.  
PR 01-SEP-1999; 99US-0151930P.  
PR 07-SEP-1999; 99US-0152633P.  
PR 10-SEP-1999; 99US-0153707P.  
PR 13-SEP-1999; 99US-0153758P.  
PR 15-SEP-1999; 99US-0154018P.  
PR 16-SEP-1999; 99US-0154039P.  
PR 20-SEP-1999; 99US-0154779P.  
PR 22-SEP-1999; 99US-0155139P.  
PR 23-SEP-1999; 99US-0155486P.  
PR 24-SEP-1999; 99US-0155659P.  
PR 28-SEP-1999; 99US-0156458P.  
PR 29-SEP-1999; 99US-0156596P.  
PR 04-OCT-1999; 99US-0157117P.  
PR 05-OCT-1999; 99US-0157765P.  
PR 06-OCT-1999; 99US-0157865P.  
PR 07-OCT-1999; 99US-0158029P.  
PR 08-OCT-1999; 99US-0158232P.  
PR 12-OCT-1999; 99US-0158369P.  
PR 13-OCT-1999; 99US-0159293P.  
PR 13-OCT-1999; 99US-0159294P.  
PR 13-OCT-1999; 99US-0159295P.  
PR 14-OCT-1999; 99US-0159329P.  
PR 14-OCT-1999; 99US-0159330P.  
PR 14-OCT-1999; 99US-0159331P.  
PR 14-OCT-1999; 99US-0159637P.  
PR 14-OCT-1999; 99US-0159638P.  
PR 18-OCT-1999; 99US-0159584P.  
PR 21-OCT-1999; 99US-0160741P.  
PR 21-OCT-1999; 99US-0160767P.  
PR 21-OCT-1999; 99US-0160768P.  
PR 21-OCT-1999; 99US-0160770P.  
PR 21-OCT-1999; 99US-0160814P.  
PR 21-OCT-1999; 99US-0160815P.  
PR 22-OCT-1999; 99US-0160980P.  
PR 22-OCT-1999; 99US-0160981P.  
PR 22-OCT-1999; 99US-0160982P.  
PR 22-OCT-1999; 99US-0160989P.  
PR 25-OCT-1999; 99US-0161404P.  
PR 25-OCT-1999; 99US-0161405P.  
PR 26-OCT-1999; 99US-0161406P.  
PR 26-OCT-1999; 99US-0161359P.  
PR 26-OCT-1999; 99US-0161360P.

PR 26-OCT-1999; 99US-0161361P.  
PR 28-OCT-1999; 99US-0161920P.  
PR 28-OCT-1999; 99US-0161929P.  
PR 28-OCT-1999; 99US-0161933P.  
PR 29-OCT-1999; 99US-0162142P.

Query Match 100.0%; Score 63; DB 3; Length 262;  
Best Local Similarity 100.0%; Pred. No. 0.0019;  
Matches 11; Conservative 0; Mismatches 0; Indels 0; Gaps 0;

OY 1 DMLKQGMIRP 11  
44 DMLKQGMIRP 54  
Db

RESULT 3  
AAG05067  
ID AAG05067 standard; protein; 267 AA.

AC AAG05067;  
XX  
DT 17-OCT-2000 (first entry)

XX Arabidopsis thaliana protein fragment SEQ ID NO: 1331.

KW Protein identification; signal transduction pathway; metabolic pathway;  
KW hybridisation assay; genetic mapping; gene expression control; promoter;  
XX termination sequence.

OS Arabidopsis thaliana.

FN EPI033405-A2.

XX  
PD 06-SEP-2000.

XX  
PE 25-FEB-2000; 2000EP-00301439.

XX  
PR 25-FEB-1999; 99US-0121825P.

PR 05-MAR-1999; 99US-0123180P.

PR 09-MAR-1999; 99US-0123548P.

PR 23-MAR-1999; 99US-0125788P.

PR 25-MAR-1999; 99US-0126264P.

PR 29-MAR-1999; 99US-0126785P.

PR 01-APR-1999; 99US-0127462P.

PR 06-APR-1999; 99US-0128234P.

PR 08-APR-1999; 99US-0128714P.

PR 16-APR-1999; 99US-0129845P.

PR 19-APR-1999; 99US-0130077P.

PR 21-APR-1999; 99US-0130449P.

PR 23-APR-1999; 99US-0130510P.

PR 28-APR-1999; 99US-0130891P.

PR 30-APR-1999; 99US-0131449P.

PR 30-APR-1999; 99US-0132048P.

PR 30-APR-1999; 99US-0132407P.

PR 04-MAY-1999; 99US-0132484P.

PR 05-MAY-1999; 99US-0132485P.

PR 06-MAY-1999; 99US-0132486P.

PR 06-MAY-1999; 99US-0132487P.

PR 07-MAY-1999; 99US-0132863P.

PR 11-MAY-1999; 99US-0134256P.

PR 14-MAY-1999; 99US-0134218P.

PR 14-MAY-1999; 99US-0134219P.

PR 14-MAY-1999; 99US-0134221P.

PR 14-MAY-1999; 99US-0134370P.

PR 18-MAY-1999; 99US-0134768P.

PR 19-MAY-1999; 99US-0134941P.

PR 20-MAY-1999; 99US-0135124P.

PR 21-MAY-1999; 99US-0135533P.

PR 24-MAY-1999; 99US-0135629P.

PR 25-MAY-1999; 99US-0136021P.

PR 27-MAY-1999; 99US-0136392P.

PR 28-MAY-1999; 99US-0136782P.

PR 28-MAY-1999; 99US-0137222P.

PR 03-JUN-1999; 99US-0137528P.

PR 04-JUN-1999; 99US-0137502P.

PR 07-JUN-1999; 99US-0137724P.

PR 08-JUN-1999; 99US-0138094P.

PR 10-JUN-1999; 99US-0138540P.

PR 14-JUN-1999; 99US-0138847P.

PR 14-JUN-1999; 99US-0139119P.

PR 16-JUN-1999; 99US-0139452P.

PR 17-JUN-1999; 99US-0139453P.

PR 18-JUN-1999; 99US-0139454P.

PR 18-JUN-1999; 99US-0139455P.

PR 18-JUN-1999; 99US-0139456P.

PR 18-JUN-1999; 99US-0139457P.

PR 18-JUN-1999; 99US-0139458P.

PR 18-JUN-1999; 99US-0139459P.

PR 18-JUN-1999; 99US-0139460P.

PR 18-JUN-1999; 99US-0139461P.

PR 18-JUN-1999; 99US-0139462P.

PR 18-JUN-1999; 99US-0139463P.

PR 18-JUN-1999; 99US-0139464P.

PR 18-JUN-1999; 99US-0139465P.

PR 21-JUN-1999; 99US-0139817P.

PR 22-JUN-1999; 99US-0139899P.

PR 23-JUN-1999; 99US-0140353P.

PR 23-JUN-1999; 99US-0140354P.

PR 24-JUN-1999; 99US-0140355P.

PR 28-JUN-1999; 99US-0140823P.

PR 29-JUN-1999; 99US-0140991P.

PR 30-JUN-1999; 99US-0141287P.

PR 01-JUL-1999; 99US-0141842P.

PR 01-JUL-1999; 99US-0142154P.

PR 02-JUL-1999; 99US-0142055P.

PR 06-JUL-1999; 99US-0142390P.

PR 08-JUL-1999; 99US-0142803P.

PR 09-JUL-1999; 99US-0142920P.

PR 12-JUL-1999; 99US-0142977P.

PR 13-JUL-1999; 99US-0143542P.

PR 14-JUL-1999; 99US-0143624P.

PR 15-JUL-1999; 99US-0144005P.

PR 16-JUL-1999; 99US-0144085P.

PR 19-JUL-1999; 99US-0144325P.

PR 19-JUL-1999; 99US-0144331P.

PR 19-JUL-1999; 99US-0144332P.

PR 19-JUL-1999; 99US-0144333P.

PR 19-JUL-1999; 99US-0144334P.

PR 19-JUL-1999; 99US-0144335P.

PR 20-JUL-1999; 99US-0144352P.

PR 20-JUL-1999; 99US-0144632P.

PR 20-JUL-1999; 99US-0144684P.

PR 21-JUL-1999; 99US-0144814P.

PR 21-JUL-1999; 99US-0145086P.

PR 22-JUL-1999; 99US-0145087P.

PR 22-JUL-1999; 99US-0145088P.

PR 22-JUL-1999; 99US-0145089P.

PR 22-JUL-1999; 99US-0145090P.

PR 22-JUL-1999; 99US-0145192P.

PR 23-JUL-1999; 99US-0145145P.

PR 23-JUL-1999; 99US-0145218P.

PR 23-JUL-1999; 99US-0145244P.

PR 26-JUL-1999; 99US-0145276P.

PR 27-JUL-1999; 99US-0145913P.

PR 27-JUL-1999; 99US-0145918P.

PR 27-JUL-1999; 99US-0145919P.

PR 28-JUL-1999; 99US-0145951P.

PR 02-AUG-1999; 99US-0146386P.

PR 02-AUG-1999; 99US-0146388P.

PR 02-AUG-1999; 99US-0146389P.

PR 03-AUG-1999; 99US-0147038P.

PR 04-AUG-1999; 99US-0147204P.

PR 05-AUG-1999; 99US-0147192P.